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EXAMINER

GOLOBOY, JAMES C

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/775,086

Applicant(s)

CALVO ET AL.

Examiner

James Goloboy

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/25/2004 and 11/30/2005.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 17 is objected to because of the following informalities: The word "twenty" should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the limitation of "fifty parts by weight of N-methylpyrrolidone" is indefinite, as the "fifty parts by weight" is not defined in relation to the concentration of another component.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1714

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by MacDiarmid (U.S. Pat. No. 5,645,890).

McDiarmid, in the reference's abstract, discloses a method for improving the corrosion inhibition of a metal surface by coating with a polyaniline film. Polyaniline is an intrinsically conducting polymer and has lubricant polymers, meeting the limitations of Claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-4, 10-12, 14, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia (U.S. Pat. No. 5,407,590) in view of Diaz (U.S. Pat. No. 5,641,841).

Art Unit: 1714

Salvia, in the abstract, discloses a composite with lubricant and anticorrosion properties, containing a transition metal solid lubricant and a polymer. The solid lubricant, as recited in Claims 2 and 23, may be molybdenum disulfide, as recited in Claims 12 and 26. Salvia further discloses in column 3 line 67 through column 4 line 25 that the film may be formed by applying the material to a surface as a suspension in a liquid, as recited in Claim 4. Salvia does not disclose an intrinsically conductive polymer, particularly polyaniline, as a polymer for use in the composition.

Diaz, in the abstract, discloses a lubricant composition comprising an emeraldine salt of polyaniline, which is an intrinsically conductive polymer, meeting the limitations of Claims 1, 14, and 23. In Diaz's Claim 7, a composition comprising ~3% polyaniline by weight is taught, falling within the ranges disclosed in Claims 10-11 and 24-25. Also, the solution formed within the reference's Claim 7 meets the requirements of the currently presented Claim 3. The lubricant of Salvia, using the polyaniline taught by Diaz, meets the limitations of Claims 1-4, 10-12, 13, and 23-26.

It would have been obvious to one of ordinary skill in the art to use the polyaniline of Diaz in the lubricant composition of Salvia, as the conductivity of the polymer helps to prevent buildup of static charges, as taught in column 2 lines 51-65 of Diaz.

9. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz as applied to claim 4 above, and further in view of Hawkins (5,976,419).

Art Unit: 1714

The discussions of Salvia in view of Diaz in paragraph 8 above is incorporated here by reference. Salvia in view of Diaz does not provide a method of brushing or spraying a wet film onto a metal surface.

Hawkins, in column 5 lines 13-17, teaches that a wet coating containing polyaniline may be applied to a metal surface by brushing, as recited in Claim 5, or spraying, as recited in Claim 6. It would have been obvious to one of ordinary skill in the art to apply the wet film of Salvia in view of Diaz to a metal surface by brushing or spraying, as such methods are well known in the art, as taught in column 5 lines 9-11 of Hawkins.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz as applied to claim 1 above, and further in view of Marchandise (U.S. Pat. No. 6,258,242).

The discussion of Salvia in view of Diaz in paragraph 8 above is incorporated here by reference. Salvia in view of Diaz does not provide a method of depositing the dry film by electropolymerization.

In column 3 line 22, Marchandise teaches the deposition of polyaniline by electropolymerization, as recited in Claim 7, and in column 3 lines 14-15 teaches that this deposition is done on a metal (titanium) surface.

It would have been obvious to one of ordinary skill in the art to deposit the film of Salvia in view of Diaz on a metal surface by electropolymerization as taught by Marchandise, as such a method causes the film to adhere well to the metal.

11. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz as applied to claim 1 above, and further in view of Kimpel (U.S. PG Pub. No. 2002/0166770).

The discussion of Salvia in view of Diaz in paragraph 8 above is incorporated here by reference. Salvia in view of Diaz does not disclose electrophoretic deposition of the film.

Kimpel discloses a method of electrophoretically coating a surface. In paragraph 17 line 7 Kimpel teaches that the surface may be a metal surface. In paragraph 13 line 13 Kimpel teaches that an electrically conductive polymer such as polyaniline may be electrodeposited onto the surface, as recited in Claim 8, and in paragraph 13 line 12 teaches that molybdenum disulfide, a solid lubricant, may also be deposited. In paragraph 13 lines 1-2 Kimpel discloses that the coating may consist of more than one of the above constituents, allowing the polymer to be deposited in the presence of the solid lubricant as recited in Claim 9.

It would have been obvious to one of ordinary skill in the art to deposit the film of Salvia in view of Diaz by the electrophoretic process taught by Kimpel for the purpose of coating a three-dimensional object, as taught in paragraph 4 of Kimpel.

12. Claims 13 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz as applied to claims 2 and 23 above, and further in view of

Art Unit: 1714

Dickey (*Lubrication and Lubricants*, in *Kirk-Othmer Encyclopedia of Chemical Technology*, Vol. 15, p 32-33, 71).

The discussion of Salvia in view of Diaz in paragraph 8 above is incorporated here by reference. Salvia in view of Diaz discloses a molybdenum disulfide solid lubricant but not graphite.

Dickey, on pages 32-33, teaches that graphite is a preferred solid lubricant along with molybdenum disulfide, and possesses film-forming abilities when mixed with an organic material. The use of graphite as a solid lubricant in the compositions of Salvia and Diaz therefore meets Claims 13 and 27.

It would have been obvious to one of ordinary skill in the art to use graphite as a solid lubricant in the composition of Salvia in view of Diaz, as graphite is commonly used in the art, as taught on pages 32-33 of Dickey, and also because graphite is conductive, as taught on page 71 of Dickey, further enhancing the conductivity of the composition.

13. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz as applied to claim 14 above, and further in view of Wang (U.S. Pat. No. 6,875,480).

The discussion of Salvia in view of Diaz in paragraph 8 above is incorporated here by reference. Salvia in view of Diaz teaches a method of applying a polyaniline film to a surface by adding a liquid suspension or solution of polyaniline and allowing the solvent to evaporate; however, Salvia in view of Diaz does not teach specific solvents.

Wang, in figure 1, step 3, teaches the application of an aniline-containing solution to a surface. In column 3 line 42 Wang teaches that the solvent may be n-methylpyrrolidone, as recited in Claim 15, and in column 4 lines 47-49 teaches that the solvent is evaporated, leaving an aniline film on the surface.

It would have been obvious to one of ordinary skill in the art to use n-methylpyrrolidone, as taught by Wang, as a solvent for the application of the film of Salvia in view of Diaz to a surface, as it is volatile enough to evaporate at room temperature.

14. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz as applied to claim 4 above, and further in view of Shimakura (U.S. PG Pub. No. 2004/0009300)

The discussion of Salvia in view of Diaz in paragraph 8 above is incorporated here by reference. Salvia in view of Diaz does not disclose a method of applying multiple layers of the composition.

Shimakura discloses a method for coating a metallic surface, where the coating may comprise an anticorrosion component. In paragraph 91 lines 1-4, Shimakura teaches that multiple layers of the anticorrosion component may be applied, as in Claim 16, and more specifically up to four layers. As the number of layers must be an integer, it is the examiner's position that four layers overlaps with the range recited in Claim 17 at the lower bound of "about 5". In paragraph 107 lines 11-12 Shimakura teaches that

Art Unit: 1714

the anticorrosion layers may comprise an electrically conductive polymer such as polyaniline.

It would have been obvious to one of ordinary skill in the art to apply the film of Salvia in view of Diaz in multiple layers, as taught by Shimakura, to improve the corrosion protection provided by the film and to achieve a desired thickness.

15. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz further in view of Shimakura as applied to claim 16 above, and further in view of DeBerry (J. Electrochem. Soc., 1985, 132(5), 1022-1026).

The discussion of Salvia in view of Diaz further in view of Shimakura in paragraph 14 above is incorporated here by reference. The combination of Salvia, Diaz, and Shimakura discloses the coating of metal by up to four layers of polyaniline for the purpose of corrosion protection. However, the combination does not teach a preferred thickness for the polyaniline layers.

DeBerry, on page 1023 column 2, discloses a polyaniline film on a metal with a total thickness of 3-4 μm , and on pages 1023-1024 teaches that the film provides corrosion protection to the metal. If the corrosion protective film of DeBerry is produced containing multiple layers up to four, as taught by Shimakura, the average thickness of the layers is 0.75 to 2 μm ($3/4 = 0.75$, $4/2 = 2$), strongly overlapping the "about 1 to about 2" μm range recited in Claim 18.

It would have been obvious to one of ordinary skill in the art to apply the polyaniline film layers of Salvia in view of Diaz further in view of Shimakura in a

Art Unit: 1714

thickness such that the total thickness of the film is equal to the 3-4 μm taught by DeBerry, as DeBerry teaches that this is an effective amount of polyaniline film for corrosion protection.

16. Claims 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz as applied to claim 1 above, and further in view of Miyamoto (U.S. Pat. No. 4,838,957).

The discussion of Salvia in view of Diaz in paragraph 8 above is incorporated here by reference. Salvia in view of Diaz does not disclose the use of a converting compound along with the film.

Miyamoto describes a process for phosphating metal surfaces, and in column 2 lines 38-45 notes that these phosphated surfaces can be used to provide adhesion to electrodeposited compositions, meeting the requirements of Claims 19 and 21. In column 5 lines 17 and 19 Miyamoto teaches that manganese phosphate and zinc phosphate, as recited in Claims 20 and 22, are suitable phosphate sources for the conversion coating described by Miyamoto.

It would have been obvious to one of ordinary skill in the art to include in the method of Salvia in view of Diaz the step of using a conversion coating, as described by Miyamoto, for the purpose of improving the adhesion of the dry film to the metal surface, as taught by Miyamoto in column 2 lines 38-45.

Art Unit: 1714

17. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salvia in view of Diaz as applied to claims 1 and 23 above, and further in view of Fredrick (U.S. Pat. No. 6,227,951).

The discussion of Salvia in view of Diaz in paragraph 8 above is incorporated here by reference. Salvia in view of Diaz discloses the coating of a metal with a corrosion-resistant film containing a conductive polymer and a solid lubricant, but does not teach the use of these coated metals in a threaded connection.

Fredrick, in Figures 1-2, discloses a threaded connection, and in column 4 lines 13-30 discloses that the components of the threaded connection can be metal. In column 3 lines 13-15 Fredrick teaches that the components of the connection are preferably provided with a dry film lubricant, and in column 4 lines 64-65 further teaches that a solid lubricant such as molybdenum disulfide or graphite may be a component of the dry film. The use of the dry film lubricant described by Salvia in view of Diaz in the threaded connection of Fredrick meets the conditions of Claim 30.

It would have been obvious to one of ordinary skill in the art to use the dry film of Salvia in view of Diaz as the lubricant in the threaded connection of Buford, as the polymer provides extra corrosion protection to the metal components.

Conclusion

Art Unit: 1714

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Goloboy whose telephone number is 571-272-2476. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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